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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

XR COMMUNICATIONS, LLC d/b/a VIVATO TECHNOLOGIES, Plaintiff, v. DELL TECHNOLOGIES INC. and DELL INC., Defendants.	Case No. 1:22-CV-00861-RP Hon. Robert Pitman Special Master David Keyzer **SPECIAL MASTER REPORT AND RECOMMENDATION ON CLAIM CONSTRUCTION**

The undersigned, having been appointed as a Special Master pursuant to Rule 53 of the Federal Rules of Civil Procedure, submits this Report and Recommendation on Claim Construction.

Table of Contents

I. INTRODUCTION

Plaintiff XR Communications, LLC d/b/a Vivato Technologies ("Plaintiff" or "XR" or "Vivato") asserts United States Patent No. 10,715,235 ("the '235 Patent") against Defendants Dell Technologies Inc. and Dell Inc. (collectively, "Defendants" or "Dell").

Before the Special Master are Defendants' Opening Claim Construction Brief (Dkt. 39), Plaintiff's Opening Claim Construction Brief (Dkt. 41), Defendants' Reply Claim Construction Brief (Dkt. 43), and Plaintiff's Sur-Reply Claim Construction Brief (Dkt. 47). Also before the Special Master is the parties' June 8, 2022 Joint Claim

Construction Statement (Dkt. 49).

Pursuant to the Court's January 20, 2023 Order (Dkt. 68), the Special Master entered an order regarding claim construction proceedings and conducted a claim construction hearing on January 27, 2023. (*See* Dkt. 70, Jan. 23, 2023 Special Master Order No. SM-1.) The parties appeared as follows:

Present for Plaintiff (XR)	Present for Defendants (Dell)	Reporter
James Pickens	Brady Cox Michael Newton Lauren Griffin William Bullard Derek Lam (corporate representative) Kean Hiri (corporate representative)	Robin LaFemina

The Special Master convened the claim construction hearing by videoconference on January 27, 2023, at 12:10 P.M. Central Time. The Special Master heard arguments by James Pickens on behalf of Plaintiff and by Brady Cox, Michael Newton, and William Bullard on behalf of Defendants. The Special Master took recesses from 1:16 P.M. to 1:30 P.M. and 2:15 P.M. to 2:20 P.M. The Special Master adjourned the claim construction hearing at 2:56 P.M.

Based on the above-cited briefing as well as the oral arguments presented by counsel at the January 27, 2023 hearing, the Special Master construes the disputed terms as set forth herein.

II. THE PATENTS-IN-SUIT

Plaintiff asserts United States Patent No. 10,715,235 ("the '235 Patent") against Defendants.[1] Plaintiff submits that the patents-in-suit relate to "beamforming" in the field of wireless communications such as Wi-Fi. (Dkt. 41 at 2.)

The '235 Patent, titled "Directed Wireless Communication," issued on July 14, 2020, and bears an earliest priority date of November 4, 2022. The Abstract of the '235 Patent states:

> Disclosed herein are methods and apparatuses configured to direct wireless communication. In some embodiments, a network apparatus is configured to: receive a first signal transmission from a remote station via a first antenna element of an antenna and a second signal transmission from the remote station via a second antenna element of the antenna simultaneously; determine first signal information for the first transmission; determine second signal information for the second transmission, wherein the second signal information is different than the first signal information; determine a set of weighting values based on the first signal information and the second signal information, wherein the set of weighting values is configured to construct one or more beam-formed transmission signals; and generate the one or more beam-formed transmission signals based on the set of weighting values for transmission to the remote station.

Disputed terms of the '235 Patent were construed in *XR Communications LLC v. Cisco Systems, Inc., et al.* *See* Civil Action No. 6:12-CV-00623, Dkt. 56 (W.D. Tex.) (Albright, J.) ("*Cisco*"); *see also id.*, Dkt. 54, Sept. 1, 2022 Hr'g Transcript.

[1] The claim construction briefing also addresses claim terms that appear in United States Patents No. 8,289,939 and 10,594,376, which Plaintiff asserted against other defendants prior to the above-captioned case against Dell being transferred from the Waco Division to the Austin Division. (*See* Dkts. 33, 56.)

III. LEGAL STANDARDS

The Court has set forth relevant legal principles in, for example, *Visible Connections, LLC v. Zoho Corporation*, No. 1:18-CV-859-RP, Dkt. 53 (W.D. Tex. Nov. 26, 2019), such as that the "words of a claim 'are generally given their ordinary and customary meaning.'" *Id.* (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)).

IV. AGREED TERMS

In their June 8, 2022 Joint Claim Construction Statement, the parties submitted that "[t]here are no agreed-upon constructions." (Dkt. 49.)

V. DISPUTED TERMS

Shortly before the start of the January 27, 2023 hearing, the Special Master provided counsel with tentative constructions of the disputed terms for which the parties presented oral arguments. The Special Master provided the tentative constructions based on a review of the briefing and with the aim of facilitating discussion and assisting counsel in focusing their oral arguments during the hearing. The tentative constructions are set forth as to each disputed term herein.

1. "transmission nulls"

"transmission nulls" ('235 Patent, Claims 2, 4, 8, 12, 16)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning, which is "portions of one or more spatially distributed patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed."	"portions of one or more spatially distributed transmission patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed"

(Dkt. 49 at 4.)

Shortly before the start of the January 27, 2023 hearing, the Special Master provided the parties with the following tentative construction: "portions of a spatially-distributed electromagnetic transmission pattern to which no significant amounts of transmission energy are selectively directed."

(a) The Parties' Positions

Defendants argue that "Defendants' construction and the only substantive construction XR provided are the same," and "[t]his agreed construction is also consistent with the intrinsic evidence and the construction XR previously agreed to before another federal court." (Dkt. 39 at 10.) Defendants also argue that "the term 'transmission null' is a technical term whose 'plain and ordinary' meaning is not one a lay jury could be expected to understand," and "the intrinsic record provides

a specific technical meaning for the term 'transmission null'—one that the parties' agreed construction tracks." (*Id.* at 11.)

Plaintiff responds that "Defendants and XR appear to agree on the meaning of 'transmission null,' which illustrates the term has a plain and ordinary meaning to a POSITA and does not require further construction." (Dkt. 41 at 14–15.)

Defendants reply that "XR still suggests no construction is necessary simply because the parties agree[, b]ut construction here will assist the jury." (Dkt. 43 at 4.) Defendants also submit that "not construing this term now could allow XR to argue another meaning later, potentially requiring a second Markman." (*Id.*) Defendants urge that "[t]he Court should adopt the agreed construction." (*Id.*)

In sur-reply, Plaintiff argues in full as follows: "The Court should construe 'transmission nulls' as 'plain and ordinary meaning, an example of which is portions of one or more spatially distributed patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed.'" (Dkt. 47 at 4.)

At the January 27, 2023 hearing, Defendants were amenable to the tentative construction. Plaintiff noted that the Special Master's tentative construction is different from the construction agreed upon for the same term as to related United States Patent No. 10,594,376[2] in the Central District of California, wherein the parties in that case

[2] The '235 Patent and United States Patent No. 10,594,376 are "sibling" patents in the sense that both are continuations from the same prior application, namely United States Patent Application No. 15/260,147.

agreed that "transmission nulls within one or more spatially distributed patterns of electromagnetic signals" means "portions of the one or more spatially distributed patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed." (Dkt. 39, Ex. D*, XR Commc'ns, LLC d/b/a Vivato Techs. v. D-Link Sys., Inc., et al.*, 8:17-CV-596, Dkt. 280-1, Special Master Report and Recommendation on Claim Construction at 6 (C.D. Cal. Jan. 27, 2022) ("*D-Link*").) Plaintiff also urged that a plain meaning construction is appropriate, as found by Judge Albright in construing "transmission nulls" in *Cisco* to mean: "Plain and ordinary meaning wherein the plain-and-ordinary meaning is 'portions of one or more spatially distributed patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed.'" *Cisco* at p. 7 of 9. Plaintiff argued that an explicit finding of plain meaning is appropriate to make clear that there is no lexicography or disavowal.

(b) Analysis

Plaintiff proposes that "transmission nulls" should be construed to have its plain meaning, but the Special Master finds that "some construction of the disputed claim language will assist the jury to understand the claims" and to understand the particular context in which the term "transmission nulls" is used in the patents-in-suit. *TQP Dev., LLC v. Merrill Lynch & Co.*, No. 2:08-CV-471-WCB, 2012 WL 1940849, at *2 (E.D. Tex. May 29, 2012) (Bryson, J., sitting by designation).

In the Central District of California, Plaintiff agreed that the term "transmission

nulls within one or more spatially distributed patterns of electromagnetic signals" in claims of related United States Patent No. 10,594,376 means "portions of the one or more spatially distributed patterns of electromagnetic signals where transmissions of no or insignificant energy are selectively directed." (Dkt. 39, Ex. D, *D-Link* at 6.) Plaintiff here submits that it agreed to that construction to reduce the number of disputes in that particular litigation. (Dkt. 41 at 14.) Regardless of Plaintiff's motivations, however, Plaintiff's agreement is probative as to the meaning of the term "transmission nulls" and is consistent with disclosure in the specification. *See* '235 Patent at 5:56–6:14.

The parties thus being essentially in agreement as to the meaning of this term, and that meaning being consistent with the specification, the Special Master modifies the proposed language only to provide the finder of fact with a construction that is slightly easier to read and that is more harmonious with the construction of "transmission peaks," which is a disputed term addressed separately below.

The Special Master therefore hereby construes **"transmission nulls"** to mean **"portions of a spatially-distributed electromagnetic transmission pattern to which no significant amounts of transmission energy are selectively directed."**

2. "transmission peaks"

"transmission peaks" ('235 Patent, Claims 2, 4, 8, 12, 16)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning. Alternatively, "portions of one or more spatially distributed patterns of electromagnetic signals where transmissions of significant energy are selectively directed / portions of one or more spatially distributed transmission patterns of electromagnetic signals where transmissions of significant energy are selectively directed."	"portions of one or more spatially distributed transmission patterns of electromagnetic signals where transmissions of maximum energy are selectively directed"

(Dkt. 49 at 4.)

Shortly before the start of the January 27, 2023 hearing, the Special Master provided the parties with the following tentative construction: "portions of a spatially-distributed electromagnetic transmission pattern to which maximum amounts of transmission energy are selectively directed."

(a) The Parties' Positions

Defendants argue that "the ordinary meaning of a 'peak' is the maximum value or amount," and "[t]he fact that both technical and general dictionaries agree that 'peak' refers to the maximum is strong evidence that the critical characteristic of being a 'peak'

is that it describes the highest or maximum value, not some undetermined 'significant' value. (Dkt. 39 at 14.) Defendants also argue that "the specification confirms that a 'peak' refers to the maximum value." (*Id.*) Further, Defendants argue that "the prior art of record shows that 'peak' refers to the maximum." (*Id.* at 15 (citation omitted).) Finally, Defendants argue that "interpreting 'peak' to mean 'significant' as XR proposes materially changes the scope of the claim" because "[n]ot all 'significant' values are peaks," and Defendants submit that "significant" is "a poorly-defined relative and even potentially subjective term" as to which the patent-in-suit "provide[s] no indicia of how to determine if a transmission is or is not 'significant,' or what that 'significance' is to be measured in relation to." (*Id.* at 16.)

Plaintiff responds:

> First, none of Defendants' extrinsic evidence defines the full term "transmission peak." Second, none of Defendants' extrinsic evidence define the term in the context of beam-forming. Specifically, Defendant's addition of their "maximum" requirement appears to come straight out of dictionary definitions they cite for the term "peak", which are not addressing beam-forming. ECF No. 35 at 13. But this should not be used to narrow the plain meaning of "transmission peak," because "extrinsic publications may not be written by or for skilled artisans" and therefore may not reflect the complete understanding of a skilled artisan in the field of the patent. *Phillips*, 415 F.3d at 1318–19.

(Dkt. 41 at 16 (emphasis omitted).) Plaintiff also notes disclosure in the specification regarding "side lobes," arguing that "[e]ven though side lobes are not the absolute 'maximum,' they are a relative maximum, which is why Plaintiff's construction ('significant') is more consistent with the intrinsic record which clarifies side lobes can

be covered by this term." (*Id.* at 17.) Further, Plaintiff argues that "Plaintiff's alternative proposed construction is also more consistent with the intrinsic record's teachings regarding 'transmission nulls,'" "which is broader than the absolute zero and instead extends to 'relatively insignificant' portions of the pattern." (*Id.* at 18 (quoting '235 Patent at 6:10–14).)

Defendants reply: "XR creates a false dichotomy by implying that everything in the signal is either a peak or a null because energy is either significant (peak) or not significant (null). But this contradicts the undisputed notion that the peaks and nulls are merely 'portions' within the larger pattern, and that there are areas of energy that are *neither* peaks nor nulls." (Dkt. 43 at 5.) Defendants also state that "Defendants' construction allows for local maximums because it does not recite or require *one* particular maximum: '*portions* of one or more . . . where *transmissions* of maximum energy are selectively directed.'" (*Id.* at 6 (emphasis modified).) Further, Defendants argue that referring to a subjective intent to maximize power is not supported by the claim language, and Defendants submit: "XR attempts to transform a concrete term ('peaks') into a pliable one, where it could point to *any* detectable energy as a 'peak' if some party intended it. There is a much simpler solution: the peak *is* the maximum that can be objectively measured." (*Id.*) Finally, Defendants point to other instances in which the specification uses "peak" to refer to maximum, and Defendants submit that "XR does not dispute that the meaning of 'peak' in relevant dictionaries is the

maximum." (*Id.* at 6–7.)

In sur-reply, Plaintiff reiterates that the specification discloses that sidelobes can be considered to have transmission peaks, and "[b]ecause 'sidelobes' also represent transmission peaks, and 'sidelobes' are not the 'maximum,' Defendant's construction limiting 'transmission peaks' to the 'maximum' would exclude 'sidelobes' and directly contradict the intrinsic record." (Dkt. 47 at 4.) Plaintiff argues that "XR's proposal is the only one consistent with the intrinsic record" because "the specification confirms that there may be multiple 'transmission peaks,' including sidelobes, in addition to the main beam." (*Id.* at 5 (citation omitted).) Further, Plaintiff argues that "the intrinsic record confirms that a 'transmission peak' occurs when a beamformer *intends* to direct energy toward a client device, and this is recognizable from the pattern itself without precise energy measurements." (*Id.* at 5–6.)

At the January 27, 2023 hearing, Plaintiff noted that the Special Master's tentative construction is different from the construction agreed upon for the same term as to related United States Patent No. 10,594,376 in the Central District of California in *D-Link*. (*See* Dkt. 39, Ex. D*, D-Link* at 6.) Plaintiff also urged that a plain meaning construction is appropriate, as found by Judge Albright in *Cisco*, and Plaintiff submitted that Judge Albright appropriately resolved the dispute by providing an explanatory sentence (in the form of a "[n]ote not for the jury") that "[t]he plain-and-ordinary meaning of 'transmission peaks' includes relative maxima." *Cisco* at p. 8 of 9. Plaintiff

argued that the same finding would also be appropriate in the present case.

(b) Analysis

At the January 27, 2023 hearing Defendants cited inventor testimony, but inventor testimony is of little if any relevance in these claim construction proceedings. *See Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1346–47 (Fed. Cir. 2008) (inventor testimony is "limited by the fact that an inventor understands the invention but may not understand the claims, which are typically drafted by the attorney prosecuting the patent application").

Turning to the claims, Claims 1 and 2 of the '235 Patent, for example, recite (emphasis added):

> 1. A receiver for use in a wireless communications system, the receiver comprising:
>
> an antenna, wherein the antenna comprises a first antenna element and a second antenna element;
>
> a transceiver operatively coupled to the antenna and configured to transmit and receive electromagnetic signals using the antenna; and
>
> a processor operatively coupled to the transceiver, the processor configured to:
>
> receive a first signal transmission from a remote station via the first antenna element and a second signal transmission from the remote station via the second antenna element simultaneously;
>
> determine first signal information for the first signal transmission;
>
> determine second signal information for the second signal transmission, wherein the second signal information is different than the first signal information;
>
> determine a set of weighting values based on the first signal information and the second signal information, wherein the set of weighting values is configured to be used by the

transceiver to construct one or more beam-formed transmission signals;

cause the transceiver to transmit a third signal to the remote station via the antenna, the third signal comprising content based on the set of weighting values.

2. The receiver as recited in claim 1, wherein the first signal transmission and the second signal transmission comprise electromagnetic signals comprising one or more *transmission peaks* and one or more transmission nulls.

The specification discloses:

FIG. 3 illustrates an exemplary communication beam array 300 of directed communication beams 214(1), 214(2), . . . 214(N) that emanate from an antenna array 302 which is part of the antenna assembly 208. Antenna assembly 208 is also referred to herein as an "adaptive antenna" which describes an arrangement that includes the antenna array 302 having a plurality of antenna elements, and operatively supporting mechanisms and/or components (e.g., circuits, logic, etc.) that are part of a wireless routing device and configured to produce a transmission pattern that selectively places transmission nulls and/or peaks in certain directions within an applicable coverage area.

A *transmission peak of a directed communication beam 214* occurs in the transmission pattern 300 when a generated and particular amount of energy is *directed in a particular direction*. Transmission peaks are, therefore, *associated with the signal path and/or communication beam to a desired receiving node*, such as another wireless routing device or a wireless client device. *In some cases, sidelobes to a communication beam may also be considered to represent transmission peak(s).*

Conversely, a transmission null (e.g., not a communication beam) occurs in the transmission pattern when no transmission of energy occurs in a particular direction, or a relatively insignificant amount of energy is transmitted in a particular direction. Thus, a transmission null is associated with a signal path or lack of a communication beam towards an undesired, possibly interfering, device and/or object. Transmission nulls may also be associated with the *intent to maximize power in another direction (i.e., associated with a transmission peak)*, to increase data integrity or data

> security, and/or to save power, for example. A determination to direct a transmission null and/or a transmission peak (e.g., a communication beam 214) in a particular direction can be made based on collected or otherwise provided routing information which may include a variety of data associated with the operation of the multi-beam directed signal system 206, wireless routing device, and other devices at other locations or nodes within the wireless network.

'235 Patent at 5:56–6:27 (emphasis added); *see id.* at 5:40–55 ("When the electromagnetic waves are focused in a desired direction, the pattern formed by the electromagnetic wave is termed a 'beam' or 'beam pattern', such as a directed communication beam 214."); *see also id.* at 27:54–67 & Fig. 15.

The above-reproduced usage of "i.e." in the specification, although not sufficiently clear to be a lexicography as to any relevant term, uses the word "maximize" in relation to a "transmission peak." *Id.* at 6:17–19 ("Transmission nulls may also be associated with the intent to maximize power in another direction (i.e., associated with a transmission peak) . . . ."). This is intrinsic evidence that supports Defendants' proposal of using the word "maximum" in the construction for "transmission peaks." Also, other uses of "peak" in the specification, with reference to communication load, are consistent with understanding "peaks" as referring to maximums. *See* '235 Patent at 14:15–23; *see also id.* at 11:48–49 (". . . PeakLoadLimit which identifies a maximum load allowed on one channel . . . .").

Further, Defendants cite extrinsic dictionaries, including technical dictionaries, that define "peak" as referring to "maximum." (*See* Dkt. 39, Ex. H, *Hargrave's*

Communications Dictionary 389 (2001); *see also id.* at Ex. I, *Wiley Electrical and Electronics Engineering Dictionary* 559 (2004); *id.*, Ex. J, *McGraw Hill Dictionary of Scientific and Technical Terms* 1459 (5th ed. 1994); *id.*, Ex. K, *Webster's New World College Dictionary* 1059 (4th ed. 2007).)

As a general matter, "heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification." *Phillips*, 415 F.3d at 1321.

Here, however, the above-cited dictionary definitions reinforce what is apparent based on the above-discussed intrinsic evidence, namely that the patentee used the word "peak" to refer to maximums.

Plaintiff maintains, however, that "peak" can refer to a "local" maximum rather than an "absolute" maximum. (*See* Dkt. 41 at 17; *see also* Dkt. 47 at 5.) Defendants essentially agree, asserting that "Defendants' construction allows for local maximums because it does not recite or require *one* particular maximum: '*portions* of one or more . . . where *transmissions* of maximum energy are selectively directed.'" (Dkt. 43 at 6.) At the January 27, 2023 hearing, Defendants confirmed that their proposed construction is not limited to a single maximum for a transmission pattern. Also, by way of analogy, this comports with a technical dictionary cited by Plaintiff that includes a definition of "null" as a "[a] *local* minimum in an interference pattern or a directivity pattern."

(Dkt. 41, Ex. 16, *The Illustrated Dictionary of Electronics* 486 (8th ed. 2001) (emphasis added).)

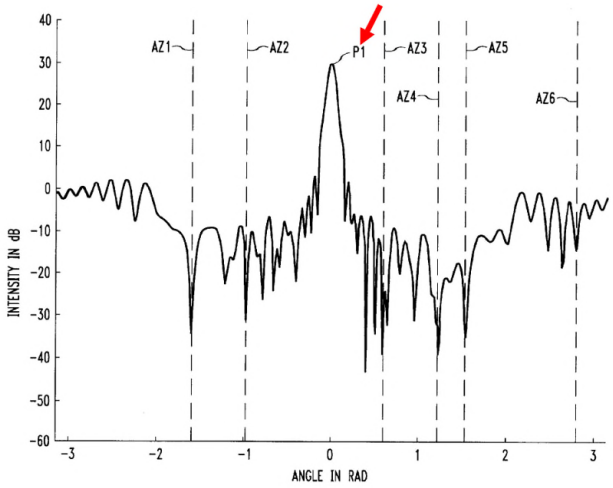
Plaintiff's reliance on disclosures that use the word "significant" are unpersuasive because those disclosures relate to transmission nulls. (*See* Dkt. 41 at 18.) To whatever extent Plaintiff is implying that the term "transmission peak" refers to everything that is not a "transmission null," Plaintiff does not persuasively support any such inference. Rather, some portions of a transmission pattern could be neither a "peak" nor a "null."

Plaintiff's expert's opinion that "transmission peaks are locations in a coverage area where a *not insignificant amount of signal energy* is directed" is likewise unpersuasive. (Dkt. 41, Ex. 4, May 6, 2022 Vojcic Decl. at ¶ 58 (emphasis added); *see id.* at ¶¶ 59–65.) Even assuming that "peaks" and "nulls" are opposites, it does not necessarily follow that every portion of a transmission pattern is either a "peak" or a "null." In other words, Plaintiff's expert does not persuasively demonstrate that "peak" refers merely to anywhere that "significant" energy is directed.

Plaintiff's suggestion that the term "transmission peak" can refer to an entire transmission "beam" is therefore also unavailing. The disclosure of "a transmission peak (e.g., a communication beam 214)" ('235 Patent at 6:20–27) does not compel otherwise because the above-reproduced disclosure demonstrates that a beam *has* a peak (or perhaps multiple peaks). *Id.* at 5:56–6:27.

This is also consistent with, for example, cited reference United States Patent No.

5,914,946 (Dkt. 39, Ex. L), which discloses "peak P1" in Figure 5 (*see id.* at 14:23–26), reproduced here (annotated by Defendants with an arrow):



This illustration, which is intrinsic evidence, reinforces that a "peak" is a part of a beam rather than an entire beam. *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1231 (Fed. Cir. 2011) ("prior art cited in a patent or cited in the prosecution history of the patent constitutes intrinsic evidence") (citations omitted).

To whatever extent Plaintiff maintains that a "transmission peak" encompasses an entire transmission "beam," Plaintiff's own expert opines that each transmission beam may have one or more peaks. (Dkt. 41, Ex. 4, May 6, 2022 Vojcic Decl. at ¶ 59 ("[A] POSITA would understand, in light of the specifications, that in the context of a spatially distributed pattern of electromagnetic signals, the pattern may exhibit a plurality of beams, each of which may have one or more different transmission peak(s).").) Defendants also persuasively argue, by way of analogy, that "halfway up the side of a mountain may be a 'significant' elevation, but it is far from the 'peak.'" (Dkt. 39 at 16.)

Further, the specification discloses that "[t]ransmission peaks are . . . *associated* with the signal path and/or communication beam to a desired receiving node." '235 Patent at 6:4–7. Indeed, the specification refers to a "transmission peak *of* a directed communication beam 214." *Id.* at 6:1–2 (emphasis added).

The parties also address disclosures in the specification that "side lobes" can have peaks. *Id.* at 6:1–9 ("In some cases, sidelobes to a communication beam may also be considered to represent transmission peak(s)."); *see id.* at 26:57–60 ("In practice, a communication beam (e.g., directional beam) has a main beam whose width can be controlled by the size of the antenna aperture, and sidelobes which vary in different directions.").

Such disclosures reinforce the apparent mutual understanding of the parties that a transmission pattern may include multiple peaks and that the term "transmission peak" refers to a "local" maximum. Judge Albright reached the same conclusion, noting that "[t]he plain-and-ordinary meaning of 'transmission peaks' includes relative maxima." *Cisco* at p. 8 of 9.

Any remaining disputes, such as whether a particular portion of a particular transmission pattern constitutes a "maximum," pertain to factual disputes regarding infringement rather than any legal question for claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("after the court has defined the claim with whatever specificity and precision is warranted by the language of

the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact"); *see also Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) ("[t]he resolution of some line-drawing problems . . . is properly left to the trier of fact") (citing *PPG*, 156 F.3d at 1355); *Eon Corp. IP Holdings LLC v. Silver Spring Networks, Inc.*, 815 F.3d 1314, 1318–19 (Fed. Cir. 2016) (citing *PPG*, 156 F.3d at 1355; citing *Acumed*, 483 F.3d at 806).

The Special Master therefore hereby construes **"transmission peaks"** to mean **"portions of a spatially-distributed electromagnetic transmission pattern to which maximum amounts of transmission energy are selectively directed."**

3. "third signal comprising content based on the weighting values"

"third signal comprising content based on the weighting values" ('235 Patent, Claims 1, 8, 15)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	"third signal carrying content, wherein the content is based on the set of weighting values" Alternatively, "third signal comprising content that is based on the set of weighting values"

(Dkt. 49 at 4.)

Shortly before the start of the January 27, 2023 hearing, the Special Master

provided the parties with the following tentative construction: "The phrase 'based on the weighting values' modifies the 'third signal.'"

(a) The Parties' Positions

Defendants argue that "the ambiguity of this phrase requires construction to clarify that the content within the signal is what must be based on the set of weighting values, and not merely the signal itself." (Dkt. 39 at 17.) Defendants rely upon the plain language of the claims as well as disclosures in the specification. (*Id.* at 17–18.)

Plaintiff responds that Defendants' proposed construction would improperly import a limitation from a preferred embodiment and, moreover, "Defendants imported verbiage could be used to argue that the claims do not cover certain embodiments—injecting *more* ambiguity, not less." (*Id.* at 19.) Plaintiff also argues that "[t]he scope of this limitation must include the disclosures that the Patent Owner cited for this limitation during prosecution." (*Id.* at 20 (citation omitted).)

Defendants reply that "[n]othing in Defendants' argument or construction requires an unambiguous disclaimer or lexicography," and "[i]t still remains unclear whether XR contends that (1) the *third signal* is the referent that must be 'based on the set of weighting values' or (2) the third signal's *content* is the referent that must be 'based on the set of weighting values.'" (Dkt. 43 at 8.) As for the prosecution history cited by Plaintiff, Defendants reply that "XR's citation to the Patent Owner's own argument during prosecution of the '235 Patent that the provisional application provided priority

support for some patent limitations is no evidence that the examiner *agreed* with that argument . . . ." (*Id.* at 9.) "Lastly," Defendants argue that "Defendants' construction is wholly consistent with dependent claims 4 and 12." (*Id.* at 10.)

In sur-reply, Plaintiff argues that "the Court should reject Defendants' narrowing proposal for what it is: an attempt to construe the claims in a manner that excludes the preferred embodiment." (Dkt. 47 at 7.) Plaintiff also argues: "[W]hen the patentee wanted to specify what the 'content' must contain, the patentee did so in claim 4, saying that the content 'comprises data.' But in claim 1, the patentee did not say that the 'content' 'comprises' anything. Instead, the patentee wrote that the 'signal' comprises content and this signal is 'based on the set of weighting values.'" (*Id.*)

At the January 27, 2022 hearing, Defendants argued that Claim 8 of the '235 Patent can only make sense if "based on the set of weighting values" modifies the "content" because those weighting values are recited as being for the *remote station* to use. Defendants also submitted that the disclosure in the specification of weighting values being used for a signal, rather than for content, should not be persuasive because there is no need to assume that all of the claims have proper written description support.

(b) Analysis

Claim 1 of the '235 Patent, for example, recites (emphasis added):

> 1. A receiver for use in a wireless communications system, the receiver comprising:
>
> an antenna, wherein the antenna comprises a first antenna element and a second antenna element;

> a transceiver operatively coupled to the antenna and configured to transmit and receive electromagnetic signals using the antenna; and
>
> a processor operatively coupled to the transceiver, the processor configured to:
>
> receive a first signal transmission from a remote station via the first antenna element and a second signal transmission from the remote station via the second antenna element simultaneously;
>
> determine first signal information for the first signal transmission;
>
> determine second signal information for the second signal transmission, wherein the second signal information is different than the first signal information;
>
> determine *a set of weighting values based on the first signal information and the second signal information*, wherein the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals;
>
> cause the transceiver to *transmit a third signal* to the remote station via the antenna, the *third signal comprising content based on the set of weighting values*.

The language of Claim 1 itself suggests that the phrase "based on the set of weighting values" modifies the "third signal" rather than the "content" because "the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals" and because the "third signal" is recited as being transmitted by the transceiver. *See Phillips*, 415 F.3d at 1314 ("the context in which a term is used in the asserted claim can be highly instructive").

Both sides also discuss the dependent claims. Claim 4 of the '235 Patent, for example, recites:

> 4. The receiver as recited in claim 1, wherein the content comprises data configured to be used by the remote station to modify the placement of one

> or more transmission peaks and one or more transmission nulls in a subsequent signal transmission.

Plaintiff argues that Defendants' proposed construction might render dependent Claim 4 (and similar dependent Claim 12) superfluous. (Dkt. 41 at 20.) Defendants argue that these dependent claims demonstrate the correctness of Defendants' proposed construction because being able to modify the placement of peaks and nulls in a subsequent transmission signals requires that the set of weighting values are incorporated into the content that is transmitted to, and used by, the remote station. Neither argument is persuasive. Neither Claim 4 nor Claim 12 resolves the question of whether the phrase "based on the set of weighting values" modifies the "content" or modifies the "third signal" because these dependent claims do not address the phrase "based on the set of weighting values." Rather, these dependent claims add a distinct limitation regarding the "content" that is recited in the independent claims as being part of the "third signal."

Defendants argue that because "based on the set of weighting values" is recited in closer proximity to the "content" than to the "third signal," the "based on . . ." language modifies the "content." *See DeGeorge v. Bernier*, 768 F.2d 1318 (Fed. Cir. 1985) ("Modifiers of a term are usually in proximity to such term."). This principle, which Defendants refer to as the "rule of proximity" (Dkt. 39 at 17), does not override the context provided by surrounding claim language (discussed above) and provided by disclosures in the specification (discussed below).

Defendants cite disclosures in the specification that "[a]ny one or more of the

electronic and computing client devices may also transmit *information* via the directed communication beams 508" and that "[i]n a described implementation, digital signals comprise one or more data *packets*." '235 Patent at 8:66–9:1 & 18:22–23 (emphasis added). Defendants argue that these disclosures "demonstrate[] that the claimed 'content' is information or data carried by the signal, and not the carrier signal itself" (Dkt. 39 at 18), but this aspect of the claim language does not appear to be in dispute.

As to what is "based on the set of weighting values," the specification provides context by disclosing "apply[ing] weighting values to the received *signals* and also to transmitted *signals*":

> FIG. 12 illustrates an exemplary implementation 1200 of the multi-beam directed signal system 206 that weighs signals received via antenna array 302. * * *
>
> * * *
>
> The stored weighting values associated with each connection, data signal, and/or source are utilized in *a weighting matrix 1210 which operates to apply the latest weighting values to the received signals and also to transmitted signals*. In this illustrative example, subsequently received signals will be processed using the most recent weighting values in the weighting matrix 1210. Thus, as described herein, the multi-beam directed signal system 206 is configured to control the transmission amplitude frequency band and directionality of data packets to other nodes and assist in reducing the effects associated with received noise and interference (e.g., self interference and/or external interference). This is accomplished with the signal control and coordination logic 304 within the multi-beam directed signal system 206.

Id. at 24:25–25:30 (emphasis added).

In light of the above-discussed surrounding claim language and in light of this

disclosure of "apply[ing] weighting values to the received signals and also to transmitted signals" (*id.*), the limitation of "cause the transceiver to transmit a third signal to the remote station via the antenna, the third signal comprising content based on the set of weighting values" refers to transmitting the "third *signal*" based on the set of weighting values.

Claim 8 of the '235 Patent differs from Claims 1 and 15 because whereas Claims 1 and 15 recite that "the set of weighting values is configured to be used by the *transceiver* to construct one or more beam-formed transmission signals," Claim 8 recites that "the set of weighting values is configured to be used by the *remote station* to construct one or more beam-formed transmission signals" (emphasis added):

> 8. A method in a wireless communications system, the method comprising:
>
> receiving a first signal transmission from a remote station via a first antenna element of an antenna and a second signal transmission from the remote station via a second antenna element of the antenna simultaneously, wherein the first signal transmission and the second signal transmission comprise electromagnetic signals comprising one or more transmission peaks and one or more transmission nulls;
>
> determining first signal information for the first signal transmission;
>
> determining second signal information for the second signal transmission, wherein the second signal information is different than the first signal information;
>
> determining a set of weighting values based on the first signal information and the second signal information, wherein *the set of weighting values is configured to be used by the remote station to construct one or more beam-formed transmission signals*; and
>
> transmitting to the remote station *a third signal comprising content based on the set of weighting values*.

Defendants argue that the set of weighting values must modify the "content" so

that the remote station can receive and use those weighting values "to construct one or more beam-formed transmission signals" as recited in the claim.

On balance, however, to whatever extent construing "based on the set of weighting values" to modify the "third signal" rather than the "content" gives rise to any purported lack of written description support for Claim 8, or purported confusion within Claim 8, Defendants' arguments perhaps may pertain to potential assertions of invalidity but do not warrant departing from the claim construction that is apparent based on the other above-discussed intrinsic evidence. *See Phillips*, 415 F.3d at 1327 ("While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.") (citation omitted).

Finally, the parties dispute whether the patentee's statements during prosecution should be given any weight. Plaintiff argues that "[t]he scope of this limitation must include the disclosures that the Patent Owner cited for this limitation during prosecution." (*See* Dkt. 41 at 20.) Plaintiff cites the principles set forth in *Vitronics* that "[i]n construing the claims we look to the language of the claims, the specification, and the prosecution history," that "[i]n those cases where the public record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper," and that "[t]he claims, the specification, and file history, rather than extrinsic

evidence, constitute the public record of the patentee's claim." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996).

In this prosecution history, the patentee stated that "transmitting to the remote station a third signal comprising content based on the set of weighting values" covers the disclosure in "Document C" of "comput[ing] the complex weights for a second RF beamformer" and "[t]he beamforming algorithm comput[ing] the beamforming weights for a particular client." (Dkt. 41, Ex. 21, July 25, 2018 Office Action Response at 3.)

The cited prosecution history statements do not significantly affect the claim construction analysis and, moreover, Plaintiff does not demonstrate how these statements would compel finding that the disputed term should be given a plain meaning construction rather than an explicit construction. (*See* Dkt. 41 at 20.)

The Special Master therefore hereby construes **"third signal comprising content based on the weighting values"** such that **the phrase "based on the weighting values" modifies the "third signal."**

4. "the set of weighting values is configured to be used by the [remote station/transceiver] to construct one or more beam-formed transmission signals"

"the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals" ('235 Patent, Claims 1, 15) **"the set of weighting values is configured to be used by the remote station to construct one or more beam-formed transmission signals"** ('235 Patent, Claim 8)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning, not indefinite.	Indefinite

(Dkt. 49 at 5.)

Because counsel did not identify these terms for oral argument, the Special Master did not provide any tentative construction(s) for these terms.

(a) The Parties' Positions

Defendants argue:

> The method of claim 8, for example, requires "receiving" signal transmissions "from a remote station." It then requires determining "a set of weighting values." This set of weighting values must, in turn, be "configured to be used by the remote station to construct one or more beam-formed transmission signals." Whether a "set of weighting values" can "be used by the remote station" in this way, however, depends on the type of "remote station" that transmitted the signals and the technology it is using—factors the claim does not specify. A POSITA, given a "set of weighting values," would have no way of knowing if it infringed the claim or not.

(Dkt. No. 39 at 18–19; *see id.* at 19–22.) Defendants also submit: "XR seems to be

suggesting that claim 8 is not referring to any particular 'remote station,' but merely any potential 'remote station' in general. This only reinforces the claim's indefiniteness—as set forth above, whether a set of weighting values is 'configured' for use by a remote station varies depending on which remote station is considered." (*Id.* at 21.) Finally, Defendants argue that even though "claims 1 and 15 state that the weighting values are 'configured to be used by the transceiver' instead of by a 'remote station,' they suffer from the same fatal flaw as claim 8." (*Id.*)

Plaintiff responds:

> Claims 1 and 15 do not recite combination with any other device or component, nor do the claims depend on the success of any combination of the claimed apparatus with another, unclaimed component.
>
> The same is true of claim 8. While claim 8 contemplates that the weighting values are "configured to be used by the *remote station*" (rather than a *transceiver* within the claimed device), claim 8 does not require the successful combination with the remote station, much less that the remote station actually use the weighting values, for a POSITA to ascertain whether the "set of weighting values" is "configured to be used by the remote station." Instead, a POSITA understands that this only requires that the device that is performing the method of claim 8 *prepare* or *arrange* the set of weighting values for subsequent use by the remote station. Vojcic Decl. ¶ 73.
>
> * * * [C]laim 8 clarifies to a POSITA that the subsequent limitation reciting "configured to be used by the remote station" *does not require combination with the remote station*, and instead requires that the set of weighting values be determined for *that* remote station based on *that* station's received signals.

(Dkt. 41 at 22.)

Defendants reply that the claims require a combination of weighting values and

remote station capabilities, and "XR does not dispute that there are many types of remote stations with different capabilities, and does not dispute that whether a set of weighting values can be used for beamforming differs from one remote station to the next." (Dkt. 43 at 11.)

In sur-reply, Plaintiff argues that "Defendants' Reply Brief abandons its arguments about Claims 1 and 15," and "Claims 1 and 15 do not require a *combination* with any other device to understand whether there is infringement." (Dkt. 47 at 8.) Plaintiff acknowledges that "Claim 8 presents a different issue from claims 1 and 15," but Plaintiff maintains that "no combination is required to ascertain if there is infringement." (*Id.*) Plaintiff argues that "the claims only require *preparing* a set of weighting values for use by another station, because 'configured to be used' means 'prepare or arrange for use,'" "[a]nd *preparing* weighting values for use by a remote station is accomplished without actually 'combining' the weighting values with the remote station—and indeed, has nothing do with whether the ultimate combination *is effective*." (*Id.*)

(b) Analysis

The Supreme Court of the United States has "read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). "A

determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations and internal quotation marks omitted), *abrogated on other grounds by Nautilus,* 134 S. Ct. 2120. "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

Claims 1 and 15 of the '235 Patent recite one of the disputed terms here at issue. Claim 15 for example recites (emphasis added; formatting modified):

> 15. An apparatus for use in a wireless communications system, the apparatus comprising:
>
> an antenna;
>
> a transceiver operatively coupled to the antenna; and
>
> a processor operatively coupled to the transceiver, the processor configured to:
>
> receive a first signal transmission from a remote station via the antenna, the first signal transmission comprising first signal information, wherein the first signal information comprises one or more of: a transmit power level, a data transmit rate, an antenna direction, quality of service data, or timing data;
>
> receive a second signal transmission from the remote station via the antenna, the second signal transmission comprising second signal information;
>
> determine a set of weighting values based on the first signal information and the second signal information, wherein *the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals*;
>
> cause the transceiver to generate a third signal comprising content based on the set of weighting values.

Defendants cite various dictionary definitions of "configure," such as meaning to

"set up" "with a view to specific applications" or so as to operate "in a particular way." (Dkt. 39, Ex. CC, *American Heritage Dictionary* 386 (4th ed. 2000); *id.*, Ex. DD, *The Authoritative Dictionary of IEEE Standards Terms* 217 (7th ed. 2000); *id.*, Ex. EE, *Merriam Webster's Collegiate Dictionary* 242 (10th ed. 1997).) The parties do not dispute the meaning of the term "configured" as a general matter.

Rather, Defendants argue that whether the "set of weighting values" is configured to be "used by the remote station to construct one or more beam-formed transmission signals" "depends on the type of 'remote station' that transmitted the signals and the technology it is using—factors the claim does not specify." (Dkt. 39 at 18–19.)

The specification discloses:

> FIG. 12 illustrates an exemplary implementation 1200 of the multi-beam directed signal system 206 that weighs signals received via antenna array 302. Communication and/or data transfer signals are received from sources 1202 (e.g., sources A and B). The signals received from sources 1202 are considered desired signals because they are from nodes within the wireless routing network. Further, signals such as noise and WLAN interference associated with another external wireless system 1204 are not desired.
>
> These signals, both desired and undesired, are received via antenna array 302 and are provided to the signal control and coordination logic 304 (shown in FIG. 3) from the receiver/transmitters (Rx/Tx) 824(0), 824(1), . . . , 824(N) (also shown in FIG. 8B). In this example, the signal control and coordination logic 304 includes the scanning receiver 822 that is configured to update routing information 1206 with regard to the received signals. For example, scanning receiver 822 may identify information about different classes of interferers (e.g., known and unknown types) within the routing information 1206. In this example, routing information 1206 includes connection indexed routing table(s) based on identification information, such as address information, CID, and the like. The routing table includes identifiers of the desired sources and other identifiers for the interferers

("Int"). Further, *the routing table includes stored weighting values (w) each associated with a particular signal source 1202 (e.g., sources A and B)*. Other information such as "keep out" identifiers may also be included in this exemplary routing table.

A description of the received signal(s) can be stored in the routing table in the form of the pattern or weighting of the signal(s). In this example, a polynomial expansion in z, $w(z)=w_0+w_1z+w_2z^2+w_3z^3+w_4z^4+ \ldots +w_iz^i$ can be utilized to establish the values of the weights (w_i) to be applied to a weight vector. The routing table(s) may store such weighing patterns as a function of θ, or the zeroes of the polynomial, for example. One advantage of zero storage is that the zeros represent directions for communication that should be nulled out to prevent self-interference or interfering with other nodes or possibly other known wireless communication systems, such as WLAN 1204 that is not part of the wireless routing network, but is operating within at least a portion of a potential coverage area 1208 and frequency bands.

The polynomial expansion in z, w(z), and the zeroes may be calculated from each other and each may be stored. Updates can be generated frequently (e.g., in certain implementations, about every millisecond), and a zero storage system may be more advantageous in most wireless network environments because only a few values will change at a given time. Storing the weighting values will in general require changes to all of the weighting values w(i) when any change in the pattern occurs. Note that w(i) and A(θ) may be expressed as Fourier transform pairs (discrete due to the finite antenna element space). The w(i) is equivalent to a time domain impulse response (e.g., a time domain unit sample response) and the A(θ) is equivalent to the frequency response (e.g., an evaluation of w(z) sampled along a unit circle).

The stored weighting values associated with each connection, data signal, and/or source are utilized in a weighting matrix 1210 which operates to apply the latest weighting values to the received signals and also to transmitted signals. In this illustrative example, subsequently received signals will be processed using the most recent weighting values in the weighting matrix 1210. Thus, as described herein, *the multi-beam directed signal system 206 is configured to control the transmission amplitude frequency band and directionality of data packets to other nodes and assist in reducing the effects associated with received noise and interference (e.g.,*

> *self interference and/or external interference)*. This is accomplished with the signal control and coordination logic 304 within the multi-beam directed signal system 206.

'235 Patent at 24:25–25:30 (emphasis added).

The specification thus discloses applying weighting values to received signals and transmitted signals so as to reduce interference. Defendants submit the opinion of their expert that there are several possible ways to configure weighting values and that a particular way of doing so might be usable by some types of remote stations but not others. (Dkt. 39, Ex. KK, Apr. 15, 2022 Paulraj Decl. at ¶¶ 45–47.)

Claims 1 and 15 (reproduced above) recite an apparatus that determines a set of weighting values and that includes a transceiver that uses the weighting values to construct one or more beam-formed transmission signals. Those weighting values are determined based on the first signal information and the second signal information, both of which are recited as being received from the remote station. These limitations are reasonably clear, and the opinions of Defendants' expert, such as that there are many possible ways to configure weighting values (each of which might be useful to some types of remote stations but not others), do not compel otherwise. (*See* Dkt. 39, Ex. KK, Apr. 15, 2022 Paulraj Decl. at ¶¶ 45–48.) Plaintiff persuasively distinguishes the *Geneva Pharmaceuticals* case cited by Defendants. *Geneva Pharms., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003). The claims there required "synergy" between a treatment and unspecified bacteria, reciting a "synergistically

effective amount" of a treatment component. *Id.* at 1384. Indefiniteness arose because "a given embodiment would simultaneously infringe and not infringe the claims, depending on the particular bacteria chosen for analysis." *Id.*; *see id.* ("'synergy' refers to activity against bacteria that the claims do not identify," and "one of skill would not know from one bacterium to the next whether a particular composition standing alone is within the claim scope or not").

Claim 8 differs from Claims 1 and 15 in that Claim 8 recites that the weighting values are "configured to be used by the remote station" (rather than by a transceiver within the recited apparatus). Claim 8 of the '235 Patent recites (emphasis added):

> 8. A method in a wireless communications system, the method comprising:
>
> receiving a first signal transmission from a remote station via a first antenna element of an antenna and a second signal transmission from the remote station via a second antenna element of the antenna simultaneously, wherein the first signal transmission and the second signal transmission comprise electromagnetic signals comprising one or more transmission peaks and one or more transmission nulls;
>
> determining first signal information for the first signal transmission;
>
> determining second signal information for the second signal transmission, wherein the second signal information is different than the first signal information;
>
> determining a set of weighting values based on the first signal information and the second signal information, wherein *the set of weighting values is configured to be used by the remote station to construct one or more beam-formed transmission signals*; and
>
> transmitting to the remote station a third signal comprising content based on the set of weighting values.

Claim 8, however, does not require the remote station to actually use the weighting values, let alone successfully. Rather, Claim 8 recites that the set of weighting

values is "*configured* to be used by the remote station" to construct one or more beam-formed transmission signals. In other words, the claim does not recite any limitation as to how, or even whether, the remote station actually uses the weighting values. Plaintiff thus again persuasively distinguishes the *Geneva Pharmaceuticals* case cited by Defendants because the claims here at issue do not require the "synergy" that was problematic in *Geneva Pharmaceuticals*. 349 F.3d at 1384. As in Claims 1 and 15, Claim 8 recites that the weighting values are determined based on the first signal information and the second signal information, both of which are recited as being received from the remote station, and these limitations are reasonably clear.

Further, Defendants argue that "under XR's proposed construction, the 'configured to be used' limitation would be superfluous because it is satisfied whenever the 'determining' limitation is" (Dkt. 43 at 13), but these are distinct limitations in which the "configur[ation]" *uses* the determined weighting values.

Finally, as to Defendants' argument that the "signal information" recited in these claims might not be sufficient to configure a set of weighting values to be used by a transceiver or a remote station (Dkt. 43 at 13), this argument perhaps might bear upon potential assertions of lack of written description or lack of enablement but does not support Defendants' assertion of indefiniteness.

Defendants thus do not meet their burden to show a lack of "reasonable certainty" as to the scope of these claims, so the Special Master hereby expressly rejects

Defendants' indefiniteness arguments. *See Nautilus*, 134 S. Ct. at 2129. Defendants do not present any alternative proposed constructions, and no further construction is necessary.

The Special Master accordingly hereby construes **"the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals"** and **"the set of weighting values is configured to be used by the remote station to construct one or more beam-formed transmission signals"** to have their **plain meaning**.

5. "remote station"

"remote station" ('235 Patent, Claims 1, 4, 8, 9, 12, 15)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	Plain and ordinary meaning, which is "remote client device."

(Dkt. 49 at 5.)

Shortly before the start of the January 27, 2023 hearing, the Special Master provided the parties with the following tentative construction: "Plain meaning."

(a) The Parties' Positions

Defendants argue that whereas "Defendants' approach properly recognizes that 'remote station' is a term of art," "XR's approach, in contrast, is a litigation-driven

strategy that extracts the term from its technical context to impermissibly broaden it." (Dkt. 39 at 22; *see id.* at 22–24.) Defendants also submit that the only devices referred to in the specification as "remote" are "client devices," and "[n]owhere in the specification are access points referred to as 'remote' or 'remote stations.'" (*Id.* at 24.) Defendants also cite prosecution history. (*Id.* at 25.)

Plaintiff responds that Defendants are not arguing that there is any lexicography or disclaimer, and "it would be error to limit the claims to a single embodiment or to several embodiments." (Dkt. 41 at 26.) Plaintiff also argues that "Defendants' proposal contradicts other preferred embodiments that disclose remote stations that correspond to remote *access* stations." (*Id.* at 27 (citation omitted); *see id.* at 27–29.) Finally, Plaintiff argues that Defendants' reliance on extrinsic evidence should be unpersuasive because "Defendants' proposed construction would not cover other usages of 'remote station' that fall within the ordinary meanings of the term." (*Id.* at 30.)

Defendants reply that it is relying not on lexicography or disavowal but rather on the plain meaning of "remote station." (Dkt. 43 at 13.) As to the portions of the specification cited by Plaintiff, Defendants argue that "none refer to a 'remote station'; none use the term 'remote' to describe an access station; and none use the phrase 'remote access station.'" (*Id.* at 14.) Defendants also argue that "XR does not identify any extrinsic evidence that uses the term 'remote station' to describe an 'access station,' let alone a 'remote access station.'" (*Id.* at 15.)

In sur-reply, Plaintiff argues that "[t]he specification expressly describes placing transmission peaks at the location of 'another wireless routing device *or* a wireless client device,' which confirms that 'remote stations' can be remote wireless routers or remote wireless clients." (Dkt. 47 at 11 (citing '235 Patent at 6:1–9).) Plaintiff also argues that "[t]he patentee's choice to use the word 'station' instead of 'access station' or 'client device' means that the patentee wanted the broader term, 'station,' which is well known to a POSITA familiar with IEEE 802.11." (Dkt. 47 at 14.)

At the January 27, 2023 hearing, Defendants argued that although it might be technically possible to perform beamforming between two access points, "remote station" has had a well-established meaning such that the patentee should have used different words if the patentee had been seeking to encompass access points. Plaintiff responded that the word "station" has been well-understood as referring to access point devices as well as non-access-point devices, such that "remote station" simply refers to whatever device is being communicated with.

(b) Analysis

The term "remote station" appears in the Abstract of the '235 Patent but does not appear in the specification outside of the claims.

Claim 1 of the '235 Patent, for example, recites (emphasis added):

> 1. A receiver for use in a wireless communications system, the receiver comprising:
>
> an antenna, wherein the antenna comprises a first antenna element and a second antenna element;

> a transceiver operatively coupled to the antenna and configured to transmit and receive electromagnetic signals using the antenna; and
>
> a processor operatively coupled to the transceiver, the processor configured to:
>
> receive a first signal transmission from a *remote station* via the first antenna element and a second signal transmission from the *remote station* via the second antenna element simultaneously;
>
> determine first signal information for the first signal transmission;
>
> determine second signal information for the second signal transmission, wherein the second signal information is different than the first signal information;
>
> determine a set of weighting values based on the first signal information and the second signal information, wherein the set of weighting values is configured to be used by the transceiver to construct one or more beam-formed transmission signals;
>
> cause the transceiver to transmit a third signal to the *remote station* via the antenna, the third signal comprising content based on the set of weighting values.

On its face, above-reproduced Claim 1 does not limit the "station" to being a client. Instead, a fair reading of "remote station" in the context of the other claim language is that the word "remote" is used merely to specify that the station is physically separate from the claimed "receiver." *See Phillips*, 415 F.3d at 1314 ("the context in which a term is used in the asserted claim can be highly instructive").

Defendants argue that "remote station" is a "term of art" that is limited to client devices. (*See* Dkt. 39 at 22–23.)

Defendants submit that a wireless network connection typically has two "ends," one being a fixed "access point" or "base station" and the other being a client such as a

laptop computer or a mobile phone. (*Id.* (citing '235 Patent at 3:43–47, 4:1–7, 4:27–37, 4:51–53, 8:66–9:8 & Fig. 1).)

Defendants also argue that the only "stations" that the '235 Patent specification refers to as "remote" are client devices. (*Id.* at 24 (citing '235 Patent at 4:1–16, 4:30–37, 4:41–43, 4:47–49, 5:9–12, 18:25–43 & Figs. 1, 2 & 9).) "Nowhere," Defendants argue, "are access points referred to as 'remote' or 'remote stations.'" (*Id.*) Defendants cite disclosure in the specification that contrasts "access station 102" with "remote client devices 104(1), 104(2) . . . ." '235 Patent at 4:1–16. Defendants also cite the general principle that "[i]t is not necessary that each claim read on every embodiment," arguing that the term "remote station" need not encompass every device that the '235 Patent discloses as a target for communication. *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010).

Defendants' arguments are unavailing. To whatever extent the claimed "remote station" corresponds to the "remote client device" disclosed regarding Figures 1, 2, and 9, these disclosures relate to a specific feature of particular disclosed embodiments that should not be imported into the more general term "remote station." *See* '235 Patent at 4:1–5:21 & 18:25–43; *see also Phillips*, 415 F.3d at 1303. This finding is consistent with the specification using the word "station" generically, such as in disclosure regarding avoiding communication collisions between stations:

> The media access technique in 802.11 is based on a Carrier Sense Multiple Access (CSMA) operation in which a [*sic*] each *station* transmits only when

> it determines that no other *station* is currently transmitting. This tends to avoid collisions that occur when two or more *stations* transmit at the same time where a collision would typically require that a transmitted packet be retransmitted.

Id. at 20:39–46 (emphasis added); *see id.* at 15:59–16:10 ("Known station interference nulls"; "Unknown station interference nulls").

And as Plaintiff points out, the specification discloses that a base station could direct a communication to "another wireless routing device" rather than necessarily to a client device. *Id.* at 6:1–9 ("Transmission peaks are, therefore, associated with the signal path and/or communication beam to a desired receiving node, such as another wireless routing device *or* a wireless client device.") (emphasis added).

Defendants cite a provisional patent application (to which the '235 Patent claims priority) in which the patentee referred to "remote stations" and illustrated laptop computers that operated as client devices, but here, too, the patentee but did not define or otherwise limit the term "remote station" so as to be limited to client devices. (*See* Dkt. 39, Ex. BB, United States Provisional Patent Application No. 60/423,660 at F-4–F-8 (pp. 181–185 of 238 of Ex. BB).).

Defendants also cite various extrinsic patents and articles that use the phrase "remote station" to refer to client devices. (*See id.*, Ex. FF (U.S. Patent No. 7,050,759), Ex. GG (U.S. Patent No. 6,862,457), Ex. HH (LaMaire 1994), Ex. II (LaMaire 2000) & Ex. JJ (Reudink 2000).) Defendants' expert opines: "Technical publications from the early 2000s uniformly use the term 'remote station' as I have described [to refer to

remote client devices], and confirm that it had a plain and ordinary meaning of 'remote client device'—again, as distinct from an access point or base station. None of these publications refer to access points or base stations as 'remote stations.'" (Dkt. 39, Ex. KK, Apr. 15, 2022 Paulraj Decl. at ¶ 29; *see id.* at ¶¶ 29–36.) Defendants submit authority that the Court may need to "look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva Pharms USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015) (citation omitted).

But the Federal Circuit has noted that "undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims[.]" *Phillips*, 415 F.3d at 1318–19. The extrinsic evidence cited by Defendants does not warrant a narrow reading of "remote station," particularly when considering that "station" appears on its face to be a broad generic term and is used broadly in the specification, as discussed above.

The Special Master therefore hereby expressly rejects Defendants' proposed construction, and no further construction is necessary. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *see also Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction."); *Bayer Healthcare LLC v.*

Baxalta Inc., 989 F.3d 964, 977–79 (Fed. Cir. 2021).

The Special Master accordingly hereby construes **"remote station"** to have its **plain meaning**.

VI. CONCLUSION

The Special Master hereby construes the disputed terms as set forth above.

Date: February 6, 2023

David Keyzer
Special Master